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NOTES ON GEOGRAPHIC DISTRIBUTION

Occurrence of *Haliscera bigelowi* Kramp, 1947 (Hydromedusae: Trachymedusae: Halicreatidae) in Northern Arabian Sea, India

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ABSTRACT: The aim of this study is to present the record of the hydromedusa *Haliscera bigelowi* Kramp, 1947 from mesopelagic environment on the Northern Arabian Sea, India.

In Indian waters, the hydrozoans are an inconspicuous group whose knowledge has greatly decreased in the last few decades due to the lack of specialists. In recent years, the records of new species are still few because plankton samples were hauled focusing especially on phytoplankton and zooplankton (mainly copepods) analysis. More than 220 species of hydromedusae were so far recorded from the Indian Seas (Menon, 1932; Santhakumari and Nair 1999; Marine biodiversity database of India, 2009). Among these forms, species of the Order Trachylina have received scanty attention so far (Venkataraman and Wafer, 2005). On the Arabian Sea, 51 species of hydromedusae have been reported so far (Santhakumari, 1977) ranging from 0-1000 m depth. *Haliscera bigelowi* Kramp, 1974 has not been reported until now, although the genus *Haliscera* was recorded from the Bay of Bengal by Navas-Pereira and Vannucci (1991).

Among earlier reports of deep-sea hydromedusae, *Haliscera bigelowi* was recorded from the Northern Atlantic waters by Kramp (1947 and 1959). Further records were provided Mills *et al.* (1996) in the central region of the Mediterranean and by Benovič *et al.* (2005) in the Adriatic Sea. This is probably the same species recorded by Bigelow (1909) from the eastern tropical Pacific (Roe *et al.*, 1984). Further information is scarce, except for Russell (1953) who provided data on taxonomy and distribution pattern of the species.

The specimens were sampled by the Fishery and Oceanographic Research Vessel (FORV) Sagar Sampada (Cruise No. 284) during January 27 to 16 February 2011. A total of 21 hauls were conducted in 21 stations from epipelagic and mesopelagic regions (0-1000 m depth) of the Northern Arabian Sea (21.00 N; 69.59 E to 16.00 N; 73.00 E). The samples were collected by vertical hauls using a Multi Plankton Net (MPN) with the size of 0.25 m^2 diameter; 300µm mesh aperture and a haul speed of 1m/s. collected specimens were preserved in 4% formaldehyde solution just after collection. All taxonomic observations and measurements were made on preserved material. The specimens were identified based on key characters (Russell, 1953; Bouillon *et al.*, 2004) and photographed under an Olympus light microscope (Model No. 8m10066) with a Sony digital camera (14.1 mega pixel; Model No. 8782743).

A total of seven individuals of *Haliscera bigelowi* were sampled in Northern Arabian Sea, India (22.59 N 66.00 E; 19.59 N 68.00 E and 17.59 N 67.59 E) at 500-1000m depth strata. Taxonomic observations were made based on the whole animal (Fig.2A), gonads, marginal tentacles and statocyst (Fig.2 B, C and D). Environmental data were recorded during the time of collection: temperature (10.5°C), salinity (35.4psu) and dissolved oxygen (0.3mg/l).

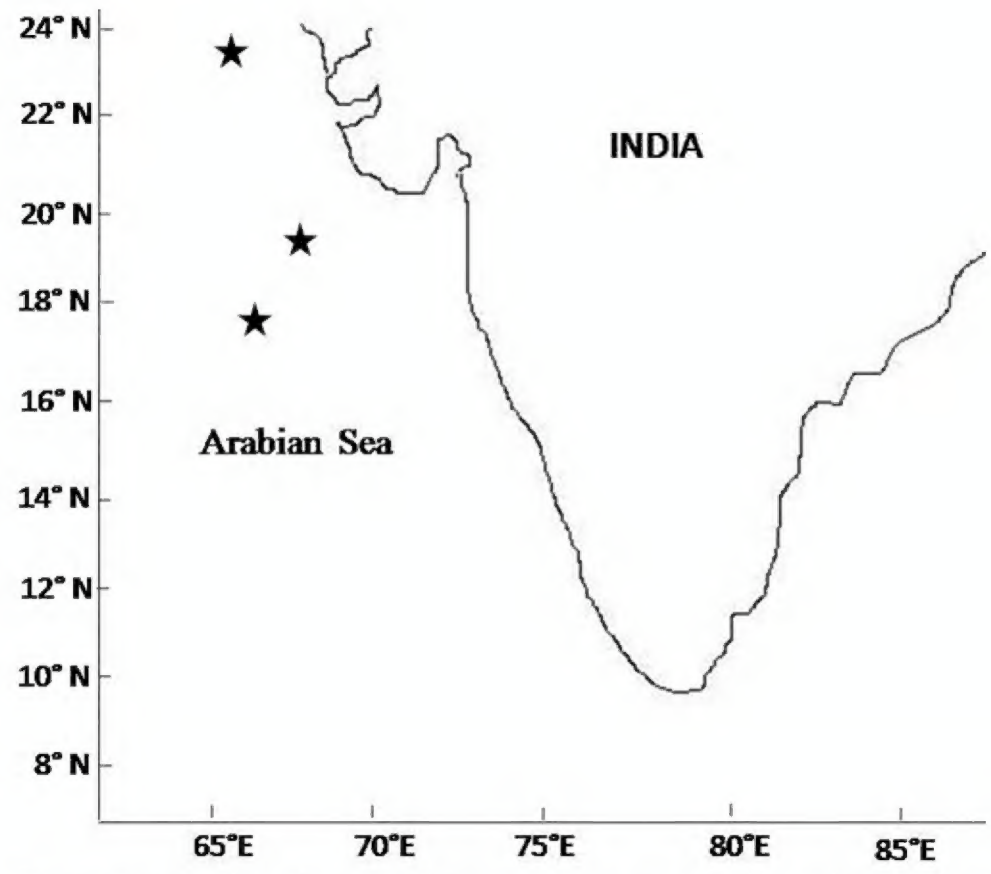

FIGURE 1. Map showing area where specimens were collected in Northern Arabian Sea.

The observed medusae present umbrella almost hemispherical ranging from 11 to 13 mm wide and 8 mm high. Thick hemispherical apex not clearly photographed because of its transparency and fragile nature. Each octant bearing 12 marginal tentacles, 3 marginal sensory clubs and 3 statocysts. Eight straight radial canals and broad

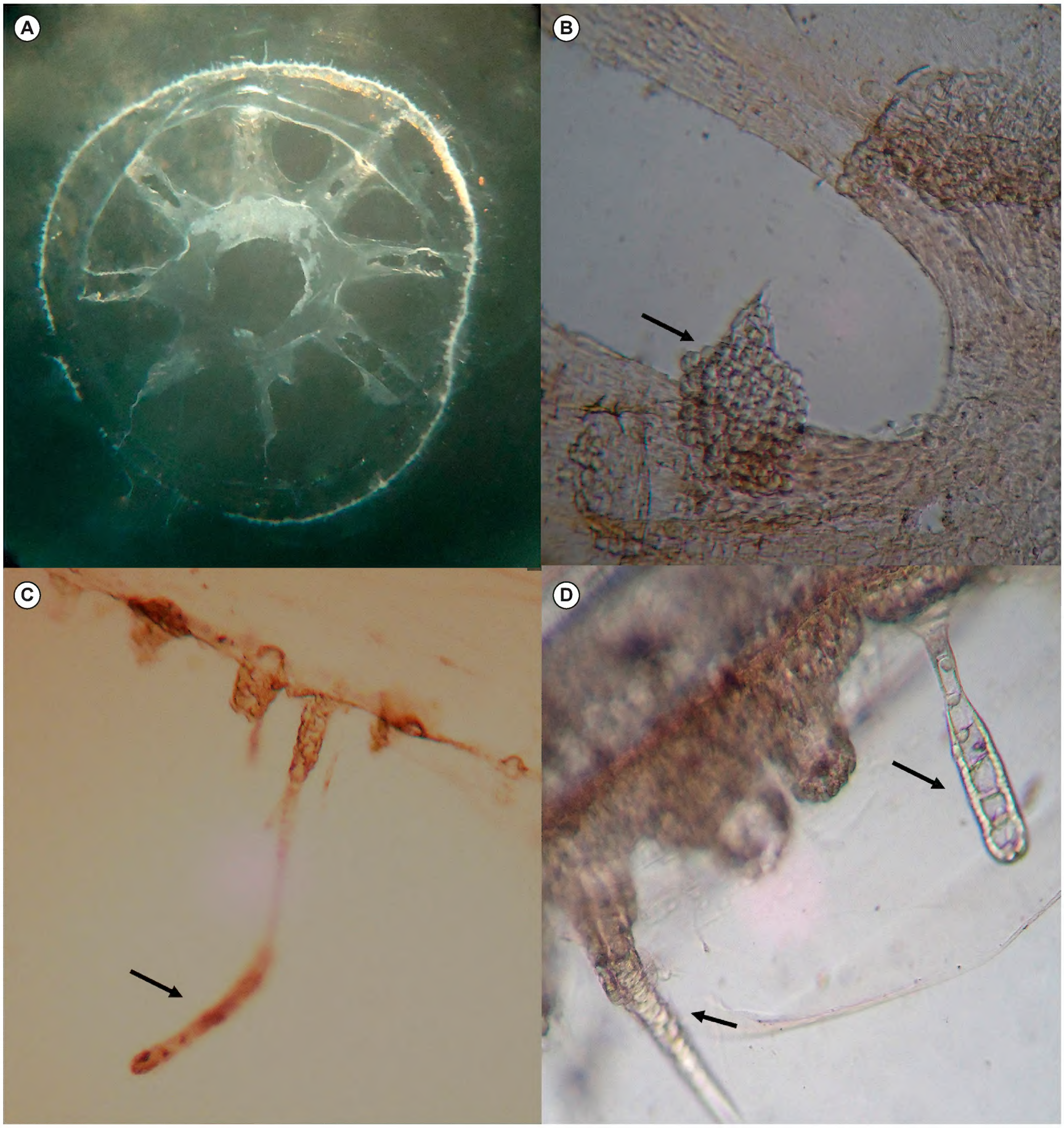

Figure 2. A) Aboral view of *Haliscera bigelowi* Kramp, 1947, B) female gonad, C) stiff distal end of marginal tentacle, D) Left, flexible proximal portion of marginal tentacle, with all the ectoderm rubbed off except at the base. Right, marginal sense organs (statocyst).

ring canal. Gonads (8) with ova situated slightly closer to manubrium rather than to bell margin; velum broad. Each gonad ova situated along 2/5 of radial canal closer to stomach rather than the ring canal.

The hydromedusa *Haliscera bigelowi* is very common in Atlantic waters as reported by Kramp (1947 and 1959). This is the first record from the Northern Arabian Sea as evidenced from earlier surveys and literature, although the genus has already been found around India (Bay of Bengal, Navas-Pereira and Vannucci, 1991). Previous studies on *Haliscera bigelowi* were carried out on different parts of the world (Bigelow, 1909; Kramp, 1947; Russell, 1953; Roe *et al.*, 1984; Mills *et al.*, 1996; Benovič *et al.*, 2005) and reported that the species as a deep-sea oceanic medusa. Alvariño (1967) reported its depth distribution ranging from 600m to 1000m depth off California, mainly related to their umbrella diameter.

In the present study *Haliscera bigelowi* was sampled during winter season (February, 2011) and showed similar mesopelagic distribution on Northern Arabian Sea being the first record for the area. This survey was carried out as parto of the MoES-CMLRE project entitled "Survey and Assessment of the Gelatinous Zooplankton in Indian EEZ".

The distribution of *H. bigelowi* is originally from around the British Isles and Atlantic, Mediterranean and Pacific Oceans. The present study extends the distribution of the species to the Northern Arabian Sea waters.

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